Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT J. SCHURKO
and FRANK G. SPENNATI

Appeal No. 95-2637
Application 08/128,051[1]

ON BRIEF

Before RONALD H. SMITH, KIMLIN and PAK, Administrative Patent Judges.

RONALD H. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-17, all the pending claims in the application.

The subject matter relates to a method for controlling the rolling temperature of the steel pieces by continuously modifying conditions in the reheat furnace in a steel mill. Claim 4 is

[1] Application for patent filed September 28, 1993. According to appellants, the application is a continuation of Application 07/742,770, filed August 9, 1991, now abandoned.

illustrative of the appealed claims and is included in the appendix.

The reference relied on by the examiner is:

Veslocki et al. (Veslocki), ?Automatic Slab Heating Control at Inland's 80-in. Hot Strip Mill?, AISE Year Book, 1986, pp 577-584.

Claims 1-17 stand rejected under 35 USC § 103 as unpatentable over Veslocki. We reverse. Since we are in substantial agreement with appellants' position as set forth in the brief, we adopt that position as our own.

The decision of the examiner is reversed.

REVERSE

RONALD H. SMITH Administrative Patent Judge	)
EDWARD C. KIMLIN Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
CHUNG K. PAK Administrative Patent Judge	)

Appeal No. 95-2637
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APPENDIX

4. In a steel mill comprising a reheat furnace for heating the steel pieces and a rolling mill for reducing the steel pieces, a method of controlling the rolling temperature of the steel pieces at a position in the rolling mill by continuously, dynamically modifying conditions in the reheat furnace comprising the steps of:

selecting from a mill practice table relating an initial aim discharge temperature of the steel pieces from the reheat furnace and an aim temperature of the steel pieces in the rolling mill for specific grades, product shapes and sizes;

using a reheat furnace model for calculating a calculated discharge temperature from the reheat furnace of a steel piece based upon grade, size, tracking information and measured temperatures in the reheat furnace, wherein said calculation of a reheat furnace discharge temperature is repeated for each steel piece leaving the reheat furnace;

modifying furnace conditions to drive said calculated discharge temperature to said aim discharge temperature;

measuring a temperature of the steel piece in the rolling mill, wherein said measuring of the steel piece temperature is repeated for each steel piece passing through the rolling mill;

determining a ratio between said calculated discharge temperature from the reheat furnace and said measured rolling mill temperatures for steel pieces in the mill;

statistically filtering said ratios to remove extreme values of said ratios based upon time in the rolling mill to provide filtered ratios;

generating a moving average of said filtered ratios to provide a current filtered relationship between said calculated discharge temperatures and said measured rolling mill temperatures;

comparing said aim rolling mill temperatures with said measured rolling mill temperatures of pieces in the mill to establish error values;

statistically filtering said error values to remove extreme values of said error values based upon time in the mill to provide filtered error values;

generating a moving average of said filtered error values;

determining a short-term bias to said aim discharge temperatures as a function of said filtered error values and said filtered ratios;

maintaining a historical table of short-term biases;

generating long-term biases specifically related to product types based upon said tables of short-term biases;

adjusting said aim discharge temperature by summing said aim discharge temperature given by the mill practice table, said long-term bias and said short-term bias; and

controlling conditions in the reheat furnace according to the furnace model and said adjusted aim discharge temperature to drive said calculated discharge temperature to said adjusted aim discharge temperature.